



# WATER SCARCITY IN INDIA: A MAJOR THREAT TO THE ECONOMY

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## ABSTRACT

Access to fresh water is one of the biggest environmental challenges of the 21st Century. According to World Health Organization 1.1 billion people lack access to clean drinking water. Nearly 2.7 billion people experience water scarcity at least one month out of the year. By 2025 it is expected that two-third of the world's population will be living in water stressed areas. The non accessibility to clean drinking water expose these vulnerable populations to deadly water borne illnesses such as diarrhoea, cholera and typhoid and every year it killing thousands of people in a developing country like India and affecting its human resource. The world population which is projected to reach 9.7 billion by 2050 the increase in the demand for agricultural land and its produce which will further put stress on use of freshwater resources. India being the second most populous country in the world is about to face the brunt of this water crisis. With the passage of time the problem of water scarcity becomes the problem of existence of human being. In this situation any new discovery of fresh water resources will be a great relief and finding new reservoirs will be blessing for humanity. Apart from new discoveries there is a need for adopting and practicing water saving measures in all aspects of life and economy.

**KEY WORDS:** Water Scarcity, Human Resource, Indian Economy, Agriculture, Food Security, Water Stress, Public Health.

## INTRODUCTION:

The water scarcity issue was discussed for the very first time in the United Nations Conference on Environment and Development at Rio de Janeiro, Brazil in 1992. Since then on March 22 every year the water related issues are highlighted and discussed at the global level. The development scenario in present world is witnessing enormous infrastructural development and the planning includes the construction of various sky scrapers, mega cities, model towns, tech equipped offices and mechanised life style. We are preparing for everything that is meant to make our lives smooth and organized in every aspect. India is also changing along with all its developmental strategies. We are living in the era where the mankind is proud enough to include artificial intelligence in various fields. We are blindly mechanizing the lifestyle adding more and more luxury to our living. On one hand these changes are giving a clear picture of development that assures an improvement in the living of human being. The other side of the picture gives a very devastating outcome in terms of apparent climate change, depleting fresh water resources, poor air quality etc. and these outcomes of development is posing a threat to human existence. The worst part of this is that we are still unmoved by these changes even after witnessing various incidences of earthquakes, frequent droughts, flood, flash flood, scanty rainfall, depleting water table and many more to be witnessed. We as humans are so adaptable in our evolution and the tendency to adapt allows us to rule the nature and conquer the world but the recent climate change has actually posed a serious threat to our existence with resources getting scarce day by day and the prices getting higher and higher. Rapid increase in population and depleting resources is the fact of everyday life. The rise in temperature, altering climate conditions and depleting water table is making the situation more worse. The free good like water is no more free as it has started to reserve an important place in the monthly consumption expenditure of every household. By 2030 two third of world's population will face water scarcity. The glaciers that are considered as grand reservoirs are melting at a very fast rate and by 2030 80% of these glaciers may be gone. This is not only posing a threat to drinking water but also to the food supply. The food supply will also disappear. The moment these glaciers are gone the source of water supply to the streams in summers are also gone leading to massive drought situation on earth.

The history of earth has witnessed five mass extinction that were caused by various reasons like natural disasters, rapid climate change, massive volcanic eruptions, meteors etc. We are on the verge of witnessing the sixth mass extinction and the human themselves are responsible for this extinction. We will keep on causing damage to our survival as long as we are leading a normal life with regular water supply, with smooth supply of electricity and the availability of food. We are still not ready to believe that this modern set up with huge infrastructure, mechanical devices to make our life easy, developmental plans may one day collapse. The history of various civilization like Mayan civilization shows that it was destroyed when it was at its peak of modernization. They too exhausted their resources faster than recharging it and the growing demands with growing population and low supply of resources led to war with nature. The over stressed and over used resources caused sudden climate change and was accompanied by series of extended droughts, floods, scanty rainfall and then shortage of food. Severe droughts leads to loss of forests that causes loss of soil that effects the growth of plants and crops causing threat to the existence of mankind. The history

of these earlier civilization gives a clear picture that they must have faced horrible periods of starvation before their extinction. The grand Roman Empire might also have faced various challenges that we are facing today as it also had a vast globalized economic expansion with over growing population and shortage of food supply and energy supply. Rising expenditures and rising fiscal and financial deficits led to collapse of their empire. Various civilization in the past have lost their fight against nature and they also failed to meet their increasing demand for food, water, energy and they were wiped out from the face of the earth.

Presently we are also witnessing the rising population, increase in the demand for wood and land for the settlement of this increasing population. This leads to cutting down of trees and this problem of deforestation could not be compensated immediately. It has been time again proved that civilizations that grow too large in terms of population and consumes too much of resources pose threat to their own survival. The fast expanding population is causing to the disappearance of rain forests and leaving us to compete with fewer resources. The situation is further worsened with the problem of water being scarce and the drought situation being frequent and extended.

Currently water scarcity is witnessed both in terms of quantity and quality and this problem is well knitted with all the problems related to human existence. Water scarcity poses threat to availability of water for drinking, for cultivation, land use, construction, management of reservoirs etc. There are millions of people on the entire earth who are facing the problem of water scarcity, even if they have access to water the quality of water is very poor and it is unable to be used. Although 70% of the earth's surface is covered with water but ironically only 3% of it is actually fresh water available for human consumption. Out of this 3% fresh water two third is hidden in glaciers and is not available for consumption. The reports of world water forum states that 1.1 billion people on earth lack access to water and 2.7 billion of people face the challenge of water scarcity at least for a month in a year. Availability of clean drinking water is a dream to millions and millions of population across the globe. Despite of this all those who have an access to safe drinking water are not utilising it wisely.

For running of manufacturing sector, maintaining adequate supply of food and for managing the day today household requirements water is an essential commodity. This commodity was earlier available free, but now it is gradually finding a place in the consumption basket of every individual. We are not very far away when everyone including rich and poor will be standing in a queue for receiving our 25 litres of water per day for our daily consumption. This is not a prediction anymore as this has already happened in Cape Town, in July 2018.

## WATER SCARCITY IN INDIA:

By 2040 there will be no drinking water in almost all of India. What are we saving for our future generations to come. Can we accept this reality for our children to stand in the queue of drinking water? A UN report on water conservation in March 2017 mentions that due to the unique geographical position in South Asia, India will be the epicentre of water crisis and conflict. In India the situation is even worse with rapid rise in population and severe depletion in resources. The Indian population is expected to rise to 1.7 billion by 2050 will struggle for more

safe drinking water for its population. Water is essential for human existence and now getting scarce too. It is even going to be more pricey than the life saving drugs in the market as it plays a pivotal role in not only quenching the thirst but to ensure the food supply for an individual. This commodity is going to bring in a huge demarcation in the category of have and have not's in the economy. An item that is important and scarce will be available at very high prices if there is a threat to its availability. Indian economy is already going through major change on its economic set up. There are various climatic changes that we are witnessing in the form of flood, drought, shifts in season, souring temperature etc. These changes have already posed threat to the availability of food supply. With nearly half of India's population that is near about 600 million population is facing extreme water stress and out of the total availability 70% is contaminated. This is a serious threat to India's GDP as India owns 17% of the total world's population but India has only 4% of freshwater resources. We are a water starved nation. The requirement of water is doubling the availability of water resource in the country. This is the need of time to realize and make the use of water sustainable in order to save it for our future generations. This is also going to cost India a loss of 6% in its GDP. The scarcity of water resource is posing a severe threat to food safety and long term public health. This will further generate stress on the political and economic condition of the country.

Severe water crisis in Chennai has raised a serious concern for the country. Insufficient monsoon for two consecutive years in the city has led to water shortage even for drinking.

In 2016 300 districts or nearly 640 millions of India's population were under the acute drinking water shortage and the governments had to run special trains at great expense to carry water to the affected areas.

Indian agriculture which is heavily depended on monsoon and India relies heavily on agriculture for supply of food and providing employment. It makes this sector very important as it still provides livelihood opportunities to 600 million people in the country. Despite its importance the technological advancement in this sector is very poor and fails to keep pace with the increasing demand for food. The agricultural sector still depends on conventional pattern of farming and depending on monsoon for its irrigation and although the world has advanced its technique and has started to adopt less water intensive crops India still uses water intensive crops which forces the farmer to commit suicide with monsoon failures.

The industries in India are responsible for contaminating Indian rivers. Over 90% of untreated industrial wastes are discharged into rivers, lakes and ponds causing contamination of fresh water sources. Electricity producing power plants guzzle gargantuan amounts of water to cool down. About 80% of electricity in India is generated through thermal power stations, burning coals, oil, gas and nuclear fuel. It is found that 90% of these thermal power plants are cooled by freshwater and nearly 40% are facing high water stress. They are going through extreme vulnerable situation to provide regular electricity supply to increasing population.

#### QUALITY OF WATER, FOOD SECURITY AND PUBLIC HEALTH IN INDIA:

Water is changing its role from providing life to taking lives. According to India's Ministry of Water Resources India only have 4% of total water resource for supporting 18% of world's population. The world Bank's latest statistics reveals that India's 163 million population lacks access to safe drinking water and 210 million population don't have the access to better sanitation facilities, 21% of communicable diseases are due to unsafe water and approximately 500 children die due to diarrhoea each day in India. A report provided by NITI Aayog mentions that Delhi along with 20 other Indian states will reach zero groundwater levels by 2020. We are the country that pumps out more water than any other country in the world. Decline in ground water is one of the major key challenges and it is further becoming severe with very fast growing suburbs and increasing stress on a single aquifer. The story gives an even more horrid picture when we find that the available ground water sources are depleting faster and these lessening numbers in terms of quantity is matched with the lessening the water quality too. The dirty aquifers are a threat to the world's second most populous country and with water reserves getting dirtier and smaller, India is losing the ability and capacity to safeguard the public health of the country, also failing in ensuring the farm productivity of the country and posing threat to food security and its further letting loose the fabric of social stability.

With incidences of severe drought and weak monsoons 60% of farm land and one fourth of India's population are facing the problem of irrigation and extending drought and this is further bringing devastation to food security by the incidences of dying crops and dried wells. This is forcing the rural families to migrate towards cities for livelihood, increasing water stress in cities too. There are farmers who are even carrying out production works in farms with untreated wastewater that contains harmful sewage-borne microorganisms and metals. This is leading to generating crops with toxic substance in them posing a threat to public health. Till date there is no particular regulatory framework for testing vegetables, fruits and crops grown with the help of untreated wastewater. This is increasing the risk of cancer spreading faster than expected and becoming the destiny of every other Indian household.

Driven by the current economic situation there is a smooth shift of population migrating from rural to urban areas in search of better economic opportunities leading to establishment of unhygienic sanitation and poor, living conditions in urban slums and urban poverty. It is expected that by 20230 590 million people will be living in cities in India that is 170 million more than today.

The water stress is even high now in most of the cities and it will worsen further. The supply of clean fresh water to produce food is diminishing even faster. The problem of deep lengthy droughts is going to grip India with more regularity and ferocity. According to NITI Aayog 70% of India's fresh water resource is contaminated. This is leading to worst water crisis in India's history. The single source of water supply is the treated or untreated industrial wastewater. We are going to pay the price of our developmental strategies. The country once known for its rivers and fresh water stream line are at present contaminated with the discharge of untreated, highly polluted industrial, municipal and agricultural wastewater. Various industries like dairies, textile, tanneries and informal battery manufacturing units have played important role in increasing the pollution of these river water. There is a presence of cocktail of heavy metals and pesticides in the river sediments which have also seeped in the ground. Presence of zinc, chromium, copper, iron and cadmium are found in the sediments of river. The rivers mostly looks like a sewage canal and a mass solid flow of industrial waste in these rivers have led to water clogging and generating unbearable stench. These river banks of Northern India, Muzaffarnagar, Delhi, Kanpur etc. are still used to carry out the farming process.

Down towards south in Bengaluru, Bellandur and Varthur Lake have also gained international attention for frothing and catching fire which was also an outcome of untreated wastewater which mostly constitutes of sodium, potassium, calcium and magnesium. These lakes once famous for its beauty are now know as a giant smelly bathtub. These toxic foams are everywhere, in the pipe in fields, and are used for producing crops.

Use of these toxic wastewater in producing food has entered our food chain and be absorbed by a mass of consumers. Heavy use of this contaminated water for irrigation has also contaminated the soil and ground water tables. These are posing threat to public health and are resulting in diseases like cancers, genetic mutations and malnutrition. According to the UK Department for International Development and the U.N Food and Agriculture Organization's International CODEX safety standard found residues of lead, zinc cadmium, copper above safe concentrations. The food items produced on the farmland irrigated by the untreated wastewater has exceeded all international thresholds for analysed heavy metal content. Bank of Yamuna river which is the tributary river of Ganges contains high level of manganese, lead, chromium and mercury above international standards. The consumption of these food items is causing to find higher level of mercury, chromium and lead in the urine and blood samples of women and children specifically in the connecting areas of these water bodies.

#### IMPACT ON INDIA'S EXPORT:

This is also going to pose serious threat to agricultural exports of the country. India being the 15th largest agricultural exporter of fishery and forestry products will be badly affected by the quality of farm produce. Countries like United States is the top export market from India's product. Other markets includes Vietnam, Saudi Arabia, China, Iran, Pakistan, Malaysia, United Kingdom, United Arab Emirates and Bangladesh. Recently United States refused 60% of the items from India to U.S markets. Two years ago UAE also barred Indian Chilli peppers, cucumbers and mangoes. UAE being one of the top four global markets for Indian fruit and vegetables and one of the major importers of Indian mangoes and onions plays an important role in export earnings for India. These bans are because of the lack of regulatory oversight in the food sector and the failure in meeting the international standards which is posing a serious threat to Indian farmers and Indian farm produce in the foreign market.

#### CONCLUSION:

A new research gives the hope of availability of water in the world as a reservoir of fresh water is discovered under the ocean. This giant aquifer is hidden deep beneath the Atlantic Ocean. It contains about 2800 cubic kilometres of water that is 739 trillion gallons of freshwater making it one of the world's largest undersea aquifer that is discovered. It is about 182 metres or 600 feet below the ocean's floor and ends at about 365 metres (1200ft). It extends about 90 km off shore and expands through the coast line of New Jersey till Massachusetts. It is expected that it dates back to ice age that is about 15000-20000 years ago. This aquifer was found by using electromagnetic mapping of the sea floor. It is not completely fresh but is low in salinity and desalination can convert them into fresh water.

As fresh water is becoming more and more scarce the discovery of such reservoir underground comes as good news for all of us. The discovery gives a ray of hope that other major reservoirs of fresh water is lying beneath the ocean and could be considered as a vital resource for people living in regions of water scarcity. Apart from searching for new reservoirs India as one of the water stressed nation of the world has also to adopt several water saving techniques. Use of drip water irrigation, rainwater harvesting to stem the loss of fresh water sources should be done extensively. Massive investment is also needed in wind and solar energy and a rejection to the usage of fossil fuel in water stressed region is to be practised in India.

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